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(54) **Process for the production of high-strength yarns and crossply laminates thereof**

(57) An ultra-high molecular weight polyolefin having a viscosity average molecular weight of at least 500,000 is subjected to melt forming into a film, the thus obtained molten film or solid state film is transversely stretched while holding both the side edges of the film, the stretched film is longitudinally slitted into tapes, and then the thus obtained tapes are longitudinally stretched thereby to produce high-strength yarns easily. A number of slits are longitudinally or transversely made in films made of an ultra-high molecular weight polyolefin having a viscosity average molecular weight of at least 500,000 so that the films each take a meshy form when spread in the direction perpendicular to the slits, and the meshy form structures are stretched in the direction of the slits to prepare meshy webs having a high strength unidirectionally. At least one member selected from the thus prepared meshy webs is used as one nonwoven web, thereby producing a high-strength, web-crossed laminated nonwoven easily.

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EUROPEAN SEARCH REPORT

Application Number
EP 96 10 4632

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The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		24 August 1998	Van Nieuwenhuize, O
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 03/82 (P04C01)



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EUROPEAN SEARCH REPORT

Application Number
EP 96 10 4632

DOCUMENTS CONSIDERED TO BE RELEVANT			
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24 August 1998	Examiner Van Nieuwenhuize, O
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EUROPEAN SEARCH REPORT

Application Number
EP 96 10 4632

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
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The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
Place of search THE HAGUE		Date of completion of the search 24 August 1998	Examiner Van Nieuwenhuize, 0
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EUROPEAN SEARCH REPORT

Application Number
EP 96 10 4632

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
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A	EP 0 379 763 A (POLYMER PROCESSING RESEARCH INSTITUTE ET AL) 1 August 1990 * claims 1,7; figure 1 *	15-17	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24 August 1998	Examiner Van Nieuwenhuize, O
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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

- ☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:
- ☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 96 10 4632

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-4

Process for manufacturing yarns by successively extruding UHMWPO film, CD-stretching, MD-slitting and MD-stretching

2. Claims: 5-7

Process for extruding UHMWPO film with low molecular weight thermoplastic skin by pump feeding the latter into the adapter or die and inflation film extruding die therefor

3. Claims: 8-17

Process for manufacturing unidirectional high strength meshy webs by successively making in slits UHMWPO film, stretching the film in slit direction, process for making meshy web-crossed laminated nonwovens and meshy web-crossed laminated nonwovens